

Remarks/Arguments

The following remarks are being filed in response to the Official Office Action of the Examiner mailed August 13, 2003, setting a three month shortened statutory period for response ending November 13, 2003. Claims 1-3 and 5-20 remain pending.

In paragraph 1 of the Office Action, the Examiner objected to the title, and in paragraph 2 of the Office Action, the Examiner objected to the abstract. Similar objections were made by the Examiner in the Office Action December 16, 2002. In the Amendment filed on February 12, 2003, Applicants amended both the title and the abstract to overcome the Examiner's objections. As such, Applicants must respectfully traverse these objections.

In paragraph 4 of the Office Action, the Examiner rejected claims 1-3 and 20 under 35 U.S.C. 103(a) as being unpatentable over Stellwagen, Jr. (U.S. Patent No. 5,835,755) in view of Robinson et al. (U.S. Patent No. 6,263,433). The Examiner acknowledges that Stellwagen, Jr. does not suggest the use of hardware utilization limits. However, the Examiner states that Robinson et al. suggest providing one or more desired hardware utilization limits (citing Robinson et al., column 6, lines 49-51, column 8, lines 13-16, column 5, lines 16-19), and remaining within the desired hardware utilization limits (citing Robinson et al., column 6, lines 44-49, column 2, lines 3-8, column 8, lines 13-16 and column 5, lines 16-19).

After careful review, Applicants must respectfully disagree. Robinson et al. relates to "a method and apparatus for distributing computer resources in a network environment" (Robinson et al., abstract). The Examiner states that Robinson et al. discloses "providing one or more desired hardware utilization limits". In support of this assertion, the Examiner cites to the following passages from Robinson et al.

Database 204 access services include services that provide the capability to create, read, write, rewrite, and delete data within a replicated database.

(Robinson et al., column 6, lines 49-51). Applicants would like to point out that this passage merely states that the database 204 access services can create, read, write, rewrite and delete data within a replicated database. This does not appear to relate in any way to "providing one or more desired hardware utilization limits", as recited in claim 1. The next passage cited by the Examiner states:

The temporal deviation between the database 204 copies will be dependent on numerous factors including hardware utilization, instantaneous transaction mix, and network 102 latency.

(Robinson et al., column 8, lines 13-16). To help provide context for the above passage,

Applicants have reproduced the following expanded passage of Robinson et al.:

In the primary/subscriber replication model 502, all update transactions are routed to a single logical system, e.g., computer system 100A-D, in the redundancy group 104, called the primary system, which propagates updates to the other logical systems, e.g., computer systems 100A-D, after the commitment of a transaction is complete. The update transaction routing is performed transparently and automatically. When the primary logical system, e.g., computer system 100A, exits the redundancy group 104 (for reasons of failure or scheduled downtime) a new primary system is selected. See the discussion relating to FIG. 2.

FIG. 6 illustrates temporal consistency of the database that is propagated by the present invention. Within either replication model 500 or 502, the database 204 will have temporal inconsistencies because time is required to update the database 204 on each of the network 102 computers within a redundancy group 104. Update propagation in replicated database 204 processing has a side effect in that a trade-off must be made between update efficiency and the temporal consistency of the database 204 copies in the redundancy group 104. It is possible to synchronize the database 204 copies by propagating updates before the completion of an update transaction, e.g., before releasing database 204 locks and allowing commit processing to complete. However, absolute synchronization requires propagation protocols that are complex and expensive from a computing perspective.

The present invention allows the database 204 copies to deviate from each

other in a temporal sense, and restrict consistency constraints to serializability and transaction-level atomicity. The approach of the present invention prevents any copy of the database 204 from having "dirty data," "partial updates," or out-of-order updates, but the timing of the appearance of the updates from a given transaction in any particular database 204 copy will be delayed to an unpredictable degree. *The temporal deviation between the database 204 copies will be dependent on numerous factors including hardware utilization, instantaneous transaction mix, and network 102 latency.* The effects of inter-copy temporal inconsistency can be mitigated with numerous application processing techniques, including restriction of updates to selected time windows (during which queries may be restricted), clever partitioning of the query processing workload, and clever partitioning and/or clustering of user queries to specific database copies.

(Emphasis Added)(Robinson et al., column 7, line 45 through column 8, line 22). As can be seen, Robinson et al. appears to distribute transaction processing across a number of computer systems that are networked together. To do so, Robinson et al. replicate a database across the number of the computer systems. Thus, when one computer system updates its copy of the database, the database update must be propagated to the other database copies located on the other computer systems.

The above-passage of Robinson et al. cited by the Examiner merely points out that there will be a temporal deviation between the database 204 copies, and that this temporal deviation will be dependent on numerous factors including hardware utilization, instantaneous transaction mix, and network latency (Emphasis Added). This, however, does not relate in any way to "providing one or more desired hardware utilization limits for the yet-to-be built database management system", as recited in claim 1. In fact, there does not appear to be any hardware utilization limits specified in Robinson et al. Instead, and to mitigate the effects of the inter-copy temporal inconsistency, Robinson et al. appear to suggest employing "numerous application processing techniques, including restriction of updates to selected time windows (during which

queries may be restricted), clever partitioning of the query processing workload, and clever partitioning and/or clustering of user queries to specific database copies". None of these mitigation methods, however, appears to relate in any way to "providing one or more hardware utilization limits", as recited in claim 1. In fact, Robinson et al. would appear to actually teach away from the invention recited in claim 1.

The next passage cited by the Examiner is as follows:

The limits of redundancy group functionality and database 204 access is limited by scenarios outside of the control of the computer system, e.g., unplanned hardware or software malfunctions, etc.

(Robinson et al., column 5, lines 16-19). Again, this passage does not suggest "providing one or more desired hardware utilization limits for the yet-to-be built database management system", as recited in claim 1.

With respect to the language "while remaining within the desired hardware utilization limits..." of claim 1, the Examiner cites to the following passage:

The shared resource services 422 component is a general container for services that provide access to shared resources. In a redundancy group 104 the shared resources of interest are replicated databases 204, and, therefore, database 204 access services reside in the shared resource services 422 component.

(Robinson et al., column 6, lines 44-49). Applicants fail to see how this discloses or suggests determining the hardware resources needed for a yet-to-be built database management system to satisfy the one or more throughput workload requirements "while remaining within the desired hardware utilization limits", as the Examiner suggests. If the Examiner elects to maintain this rejection, Applicants respectfully request that the Examiner provide a detailed explanation of how this and other passages apply to the pending claims.

In addition to the foregoing, since Robinson et al. fails to suggest the step of “providing one or more desired hardware utilization limits for the yet-to-be built database management system”, Robinson et al. cannot suggest the step of determining the hardware resources needed for the yet-to-be built database management system to satisfy the one or more throughput workload requirements “while remaining within the desired hardware utilization limits”, as recited in claim 1.

The next passage cited by the Examiner is as follows:

The redundancy group comprises at least one computing system and at a plurality of computing system partitions, and manages the replication of the database schema within the computing system and computing system partitions.

(Robinson et al., column 2, lines 3-8). Again, Applicants fail to see how this discloses or suggests determining the hardware resources needed for the yet-to-be built database management system to satisfy the one or more throughput workload requirements “while remaining within the desired hardware utilization limits”, as the Examiner suggests. In addition, and as noted above, since Robinson et al. fails to suggest the step of “providing one or more desired hardware utilization limits for the yet-to-be built database management system”, Robinson et al. cannot suggest the step of determining the hardware resources needed for the yet-to-be built database management system to satisfy the one or more throughput workload requirements “while remaining within the desired hardware utilization limits”, as recited in claim 1.

The last two passages cited by the Examiner, including Robinson et al., column 8, lines 13-16, and column 5, lines 16-19, have already been discussed above. Neither of these passages appear to suggest determining the hardware resources needed for the yet-to-be built database management system to satisfy the one or more throughput workload requirements “while

remaining within the desired hardware utilization limits”, as the Examiner suggests. In addition, since Robinson et al. fails to suggest the step of “providing one or more desired hardware utilization limits for the yet-to-be built database management system”, Robinson et al. cannot suggest the step of determining the hardware resources needed for the yet-to-be built database management system to satisfy the one or more throughput workload requirements “while remaining within the desired hardware utilization limits”, as recited in claim 1.

As the Examiner is well aware, to make a proper rejection under 35 U.S.C. 103, the prior art reference (or references when combined) must teach or suggest all the claim limitations (Emphasis Added)(see MPEP § 2143). In the present case, Robinson et al. clearly fails to suggest the steps of “providing one or more desired hardware utilization limits for the yet-to-be built database management system” and determining the hardware resources needed for the yet-to-be built database management system to satisfy the one or more throughput workload requirements “while remaining within the desired hardware utilization limits”, as recited in claim 1.

In addition to the foregoing, Applicants do not believe that the Examiner has satisfied the burden of setting forth a prima facie case of obviousness. As noted in MPEP § 2143:

The initial burden is on the examiner to provide some suggestion of the desirability of doing what the inventor has done. “To support the conclusion that the claimed invention is directed to obvious subject matter, either the references must expressly or impliedly suggest the claimed invention or the examiner must present a convincing line of reasoning as to why the artisan would have found the claimed invention to have been obvious in light of the teachings of the references.” *Ex parte Clapp*, 227 USPQ 972, 973 (Bd. Pat. App. & Inter. 1985).

(Emphasis Added). The reason given by the Examiner as to why it would have been obvious to combine Stellwagen, Jr. with Robinson et al. to arrive at the invention of claim 1 is as follows:

...since Stellwagen and Robinson teach the use of computers, the use of databases, the use of networks, the use of servers, the use of hardware, the use of software, the use of workloads, the use of requirements, the use of hardware utilization, and the use of hardware throughputs.

Even assuming that this is accurate, Applicants do not believe that merely stating that Stellwagen, Jr. and Robinson et al. both teach the use of "computers", "databases", "networks", "servers", etc., means that the combination recited in claim 1 would have been obvious. The reasons given by the Examiner do not provide any motivation or desirability of combining Stellwagen, Jr. and Robinson et al. in the manner suggested by the Examiner. As noted in MPEP § 2143, it is the duty of the Examiner to present a convincing line of reasoning as to why the artisan would have found the claimed invention to have been obvious in light of the teachings of the references. If the Examiner elects to maintain the rejection of claim 1, as well as other claims, Applicants respectfully request that the Examiner present a convincing line of reasoning as to why the artisan would have found the claimed invention to have been obvious in light of the teachings of the references, as required by MPEP § 2143.

For the foregoing reasons, as well as other reasons, claim 1 is believed to be clearly patentable over Stellwagen, Jr. in view of Robinson et al. For similar and other reasons, claims 2-3 and 20 are also believed to be clearly patentable over Stellwagen, Jr. in view of Robinson et al.

In paragraph 9 of the Office Action, the Examiner rejected claims 5-9 under 35 U.S.C. § 103(a) as being unpatentable over Stellwagen, Jr. and Robinson et al., as applied to claim 2, and

further in view of Yang et al. (U.S. Patent No. 6,542,864). For similar reasons to those given above, as well as other reasons, dependent claims 5-9 are also believed to be clearly patentable over Stellwagen, Jr. in view of Robinson et al.

In addition, enclosed herewith is the Declaration of the inventors John M. Quernemoen and Mark G. Hazzard submitted under 37 CFR §1.131, showing prior invention in the United States of the claimed inventions of the present application relative to the Yang et al. patent (U.S. Patent No. 6,542,854). As detailed in the Declaration, and shown by the evidence attached thereto, the present inventors completed the inventions included in this application prior to April 30, 1999, which is the effective filing date of the Yang et al. patent (U.S. Patent No. 6,542,854). As such, Applicants respectfully request that the Examiner withdraw all rejections of the pending claims, including claims 5-9, which are based on Yang et al. in view of the inventors' Declaration of Prior Invention.

In paragraph 14 of the Office Action, the Examiner rejected claims 10-15 under 35 U.S.C. § 103(a) as being unpatentable over Stellwagen, Jr., Robinson et al. and Yang et al. as applied to claim 9 above, and further in view of Miller et al. For similar reasons to those given, as well as other reasons, claims 10-15 are believed to be clearly patentable over Stellwagen, Jr., Robinson et al., Yang et al. and Miller et al. In addition, however, and as detailed above, Applicants respectfully request that the Examiner withdraw all rejections of the pending claims, including claims 10-15, that are based on Yang et al. in view of the inventors' Declaration of Prior Invention.

In paragraph 20 of the Office Action, the Examiner rejected claims 16-19 under 35 U.S.C. § 103(a) as being unpatentable over Stellwagen, Jr., Robinson et al. and Yang et al. For

similar reasons to those given, as well as other reasons, claims 16-19 are believed to be clearly patentable over Stellwagen, Jr., Robinson et al., and Yang et al. In addition, however, and as detailed above, Applicants respectfully request that the Examiner withdraw all rejections of the pending claims, including claims 16-19, which are based on Yang et al. in view of the inventors' Declaration of Prior Invention.

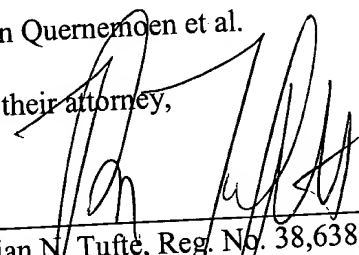
In view of the foregoing, Applicants believe that all pending claims 1-3 and 5-20 are in condition for allowance. Reexamination and reconsideration are respectfully requested. If the Examiner believes it would be beneficial to discuss the application or its examination in any way, please call the undersigned attorney at (612) 359-9348.

Respectfully submitted,

John Quernemoden et al.

By their attorney,

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Brian N. Tufte, Reg. No. 38,638
CROMPTON, SEAGER & TUFTE, LLC
1221 Nicollet Avenue, Suite 800
Minneapolis, MN 55403-2402
Telephone: (612) 677-9050
Facsimile: (612) 359-9349